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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

AGGARWAL, YOGESH K

ART UNIT

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2622

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/037,885	MASAKI ET AL.	
	Examiner	Art Unit	
	YOGESH K. AGGARWAL	2622	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 09 November 2010.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-53 and 59-108 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 17, 18, 35-53, 74, 75 and 90-108 is/are allowed.
- 6) ☒ Claim(s) 1, 3, 4, 7-14, 24-26, 28, 31-34, 59, 61, 64-71, 81, 82, 86-89 is/are rejected.
- 7) ☒ Claim(s) 2, 5, 6, 15, 16, 19-23, 27, 29, 30, 60, 62, 63, 72, 73, 76-80 and 83-85 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

Response to Arguments

1. Applicant's arguments filed 11/09/2010 have been fully considered but they are not persuasive.

Examiner's response:

2. Applicant argues with regards to claim 1 that McCaffrey fails to disclose wherein the transfer control function is based on the determined illumination intensity level mapping function. The Examiner respectfully disagrees. McCaffrey teaches that before each frame of video data is captured with the array of photodetectors, the charge capacity control voltage function is optimally adjusted so as to provide sufficient dynamic range to avoid saturation for even the brightest portions of the scene or image captured (col. 4 lines 37-43). This is done by using feedback control from previous images to set the first time period so that the brightest objects in the scene just reach the saturation capacity of the imager. Information from previous frames is used, based on the assumption that the brightness distribution of previous frames is a reliable predictor of the next frame to be captured (col. 4 lines 47-50).

McCaffrey explains this in more detail in col. 5 lines 43-col. 6 line 25, figures 2 and 3. A scene is captured by imager 201 and applied to a histogrammer 204. The histogrammer sorts the pixels into bins based on their brightness or intensities (see figure 3). From this distribution, the function generator 206 generates function information that sets the first time period for imager 201 for capturing the next frame so that light at the level of the brightest object does not saturate but will just reach the point of saturation. Thus, the function information generated by the function generator 206 for a two step non linear voltage function is a number indicating the time during the integration period at which the first voltage should change to second voltage V2.

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In a nutshell, based on the brightness or intensities of various pixels in the previous frame sorted by the histogrammer, the function generator 206 generates function information that sets the first time period for imager 201 for capturing the next frame so that light at the level of the brightest object does not saturate but will just reach the point of saturation. Therefore McCaffrey does teach wherein the transfer control function is based on the determined illumination intensity level mapping function.

3. Applicant argues that McCaffrey does not teach the transfer control function as in the specification that a control voltage that controls the integration time of the pixel wherein the integration time is the period of time the control voltage is not at the reset value for the pixel. This is not claimed in independent claims 1, 26, 59 and 82 . However dependent claims 2, 27, 60 and 83 recites the determining of integration time. Examiner understands applicant's invention and therefore these claims are objected to as being dependent upon an independent claim and therefore are deemed allowable. Furthermore, the independent claims 37, 41, 52, 92, 96 and 107 are also being allowed. Similarly claims 52 and 107 are also allowed.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

5. Claims 1, 4, 7-14, 25-26, 31-34, 59, 61, 64-71, 81, 82 and 86-89 are rejected under 35 U.S.C. 102(e) as being anticipated by McCaffrey et al. (US Patent #6,101,294).

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[Claim 1]

McCaffrey teaches a method of adaptively controlling sensitivity, on a pixel-by-pixel basis, of a digital imager (figure 2, col. 5 lines 34-41, imager 201), comprising: (a) determining a number of pixels of image data having illumination intensity levels within a first defined range of illumination intensity levels (col. 6 lines 7-25, intensity corresponding to I3) (b) determining an illumination intensity level mapping function based upon the determined number of pixels within the first defined range of illumination intensity levels (col. 6 lines 7-16); (c) determining a transfer control function based on the determined illumination intensity level mapping function (col. 6 lines 16-25); and (d) imposing the determined transfer control function upon a pixel of the digital imager (col. 6 lines 16-25, also see col. 6 lines 32-37).

[Claim 4]

McCaffrey teaches wherein the first defined range of illumination intensity levels is a range of illumination intensity levels including an illumination intensity level representing pixel saturation (see figure 1a, intensity I3).

[Claim 7]

McCaffrey teaches wherein said determination of a number of pixels of image data having illumination intensity levels within a first defined range of illumination intensity levels (intensity I3, figures 1a-1c) determines a number of pixels of image data having illumination intensity levels within a first defined range of illumination intensity levels from a frame of pixels of image data created by the digital imager (col. 6 lines 7-25).

[Claim 8]

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McCaffrey teaches wherein said determination of a number of pixels of image data having illumination intensity levels within a first defined range of illumination intensity levels determines a number of pixels of image data having illumination intensity levels within a first defined range of illumination intensity levels from a partial frame of pixels of image data created by the digital imager (col. 6 lines 7-25, only the area corresponding to brightest pixels is analyzed).

[Claim 9]

McCaffrey teaches wherein said determination of a number of pixels of image data having illumination intensity levels within a first defined range of illumination intensity levels determines a number of pixels of image data having illumination intensity levels within a first defined range of illumination intensity levels from a defined area within a frame of pixels of image data created by the digital imager (col. 6 lines 7-25, the whole area is read as a defined area).

[Claim 10]

McCaffrey teaches wherein said determination of a number of pixels of image data having illumination intensity levels within a first defined range of illumination intensity levels determines a number of pixels of image data having illumination intensity levels within a first defined range of illumination intensity levels from a user-defined area within a frame of pixels of image data created by the digital imager (since the user has to press the shutter button in order for the image taking to take place, any frame or area within the frame is considered to be a user defined area).

[Claim 11]

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McCaffrey teaches wherein the determined illumination intensity level mapping function is a calculated illumination intensity level mapping function, the calculation being based upon the determined number of pixels within the first defined range of illumination intensity levels (col. 6 lines 7-25).

[Claim 12]

McCaffrey teaches wherein the determined illumination intensity level mapping function is a selected illumination intensity level mapping function selected from a plurality of pre-specified illumination intensity level mapping functions, the selection being based upon the determined number of pixels within the first defined range of illumination intensity levels (col. 6 lines 7-25, figures 1b and 1c and histogram represent different integration times. Different integration times will have different transfer functions).

[Claim 13]

McCaffrey teaches wherein the determined transfer control function is a calculated transfer control function, the calculation being based upon the determined illumination intensity level mapping function (col. 6 lines 7-25, figure 2).

[Claim 14]

McCaffrey teaches, wherein the determined transfer control function is a selected transfer control function from a plurality of pre-specified transfer control functions, the selection being based upon the determined illumination intensity level mapping function (col. 6 lines 7-25, figures 1b and 1c represent different integration times and the histogram in figure 3 represent different intensities. Different integration times will have different transfer functions).

[Claim 25]

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McCaffrey teaches further comprising: (d) determining, for each of a plurality of defined ranges of illumination intensity levels (figures 1b and 1c has different intensity levels), a number of pixels within the defined range of illumination intensity levels when the determined number of pixels within the first defined range of illumination intensity levels is above a first threshold; and (e) determining, for each defined range of illumination intensity levels, an illumination intensity level mapping function based upon the determined number of pixels within the defined ranges of illumination intensity levels (col. 6 lines 7-25, figures 1a-1c and figure 2).

[Claim 26]

McCaffrey teaches a method of adaptively controlling sensitivity, on a pixel-by-pixel basis, of a digital imager, comprising: (a) determining a plurality of numbers of pixels, each determined number of pixels being a number of pixels within an associated defined range of illumination intensity levels (col. 6 lines 7-25, figure 2 and see figures 1b and 1c for corresponding illumination levels); (b) determining a plurality of illumination intensity level mapping functions, each determined illumination intensity level mapping function corresponding to one defined range of illumination intensity levels, each illumination intensity level mapping function being determined based upon the determined number of pixels within an associated defined range of illumination intensity levels (col. 6 lines 7-25); (c) determining a transfer control function based on the plurality of determined illumination intensity level mapping functions; (col. 6 lines 7-25); and (d) imposing the determined transfer control function upon a pixel of the digital imager (col. 7 lines 7-25)

[Claims 31-34]

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These claims are similar to claims 7-10 respectively. Therefore they have been analyzed and rejected based upon claims 7-10.

[Claims 59, 61, 64-71, 81, 82, 86-89]

These are apparatus claims corresponding to method claims 1, 4, 7-14, 25-26, 31-34 respectively and are therefore analyzed and rejected based upon method claims 1, 4, 7-14, 24-26 and 31-34.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 3, 24 and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over McCaffrey et al. (US Patent # 6,101,294).

[Claims 3 and 28]

It is noted that it is within the skill of an ordinary person i.e. the user of the camera to repeat the method (a) - (d) until a desired dynamic range is realized.

[Claim 24]

McCaffrey teaches at least three transfer functions corresponding to two different intensity levels (figures 1b and 1c has different intensity levels). However it would be a matter of design choice to set the number of transfer functions as eight wherein the number of illumination intensity level mapping functions to select from is eight in order to suitably adjust the exposure time for a particular scene.

Allowable Subject Matter

8. Claims 2,5,6,15,16,19-23,27,29,30,60,62,63,72,73,76-80 and 83-85 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.
9. Claims 17, 18, 35-53, 74, 75 and 90-108 allowed.

Conclusion

10. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to **YOGESH K. AGGARWAL** whose telephone number is (571)272-7360. The examiner can normally be reached on M-F 9:00AM-5:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Sinh Tran can be reached on (571)-272-7564. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Yogesh K Aggarwal/
Primary Examiner, Art Unit 2622